

REMARKS**A. Claim Amendments**

Claims 1 and 13 are hereby amended to correct the typographical errors which were pointed out by the Examiner in said Office Action. Claim 11 is hereby amended to correct a clerical error whereby the word "vector's" was omitted from "... said accumulation vector's phase (modulo 2π) ...", and thereby resulted in a lack of antecedent as pointed out by the Examiner in said Office Action. Independent claims 1 and 12 have also been amended for purposes of consistency, namely, to correct, in subparagraphs (b) thereof, the wording "for each sample of said diversity vectors, to instead read "for each set of sampled diversity vectors" which is consistent with the corresponding preceding wording in those subparagraphs.

No new matter is added by these corrections and each is self-evident from the original application.

B. Specification Amendment

Applicant has amended the last paragraph of page 9 of the specification, which bridges pages 9 and 10, and extends from line 20 on page 9 to line 6 on page 10. Specifically, the reference numeral "61" at line 20, page 9, has been corrected (per the original drawings) to refer to "60". As for said claim amendments, no new matter is added by this amendment.

C. 35 U.S.C. §103(a) Rejections

The Examiner has indicated that claims 1-3 and 12-14 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Lillie et al. (U.S. Patent No. 4,675,882) in view of Upadhyay et al. (U.S. Patent No. 6,115,409). Applicant respectfully requests reconsideration and withdrawal of these claim rejections by the Examiner having regard to the following submissions.

As dictated in MPEP 2143, in order to establish a *prima facie* case of obviousness, the Examiner must meet three requirements: First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to

one of ordinary skill in the art, to modify the reference or to combine reference teachings; second, there must be a reasonable expectation of success; and thirdly, the prior art reference (or references when combined) must teach or suggest all the claim limitations. With respect to the first requirement, obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art; and, where, as is the case here, there is no such teaching, suggestion or motivation because the cited references perform different functions, for different purposes, this first requirement cannot be established.

For the following reasons applicants respectfully submit that **Lillie et al.** and **Upadhyay et al.** do not disclose, teach or even suggest applicants' invention whether viewed alone or in combination. Further, there is no motivation to modify these references to provide the features of independent claim 1 or 12 of this application.

The cited references to **Lillie et al.** and to **Upadhyay et al.** pertain to very different, patentably distinguishable subject matter and cannot reasonably be construed to teach or suggest a combiner according to that claimed herein by the applicants. Unlike the teachings of either (and both) cited reference(s), applicants' aforesaid claims 1 and 12 involve: combining a plurality of input diversity I and Q signal pairs representing input diversity I and Q vectors, for use in diversity radio reception, by discriminating each sampled set of diversity I and Q vectors to produce a discriminated I and Q vector whose phase represents the frequency of the information signal and amplitude is proportional to the power of the information signal; adding the discriminated I, and the discriminated Q signals, to produce combined discriminated I and Q signals, resp., representing a combined discriminated vector whose phase is determined by one or more of the phases of that sampled set of input diversity vectors, and adding phases of the combined discriminated vectors over successive samples to produce an output combined I and Q signal pair.

Lillie et al. does not disclose, or in any way suggest, a phase accumulator performing according to claim 1 (or adding phases of combined discriminated vectors over successive samples per claim 12). The Examiner appears to have misconstrued the

labeling of block 204 ("phase accumulator stage") of Figure 2 of Lillie et al. to mistakenly infer that such might be the case. To the contrary, however, it is clear from Lillie et al.'s description of block 204 (see column 3, line 62 to column 4, line 18 and Figure 3) that this "phase accumulator stage" has two outputs, one being referred to as a "course phase" value within $\pm \pi/4$ and the other being complex and representing the input phase with the course estimation subtracted to yield what is referred to as the "fine phase". The objective and function of Lillie et al.'s said "phase accumulator stage" is to get an accurate phase estimation of the signal by (eventually) adding together those course and fine phases and this phase estimation function is performed before any discrimination takes place (see column 4, lines 9-18 stating that the resulting phase estimation is eventually differentiated to demodulate the FM signal).

By contrast, and in total dissimilarity to Lillie et al., applicants' phase accumulator integrates (adds) the phases of combined discriminated vectors (i.e. already discriminated and combined diversity vectors) over successive samples to produce an output combined I and Q signal pair which, in effect, is the reverse function of the discriminators in that it converts the discriminated FM signals back to FM.

Likewise, Upadhyay et al. does not relate to a diversity combiner and neither discloses nor even mentions anything about diversity, or any discriminator. The combiner referenced by Upadhyay et al. actually combines phase-shifted weighted antennae signals in order to reduce interference by nulling them. No discriminator performing according to claim 1 (or, per claim 12, discriminating of samples of diversity I and Q vectors to produce discriminated I and Q vectors (I_A , Q_A) having a phase representative of the frequency of the information signal and an amplitude proportional to the power of the information signal) is provided or in any way suggested by Upadhyay et al.. The Examiner appears to have misconstrued block 31 ("digital combiner #_") of Figure 5 of that cited reference to be such a discriminator, which it is not (note that a delay would have to be used if such were the case, but is not). Rather, block 31 of Upadhyay et al. is a phase-shifter used to implement beam-forming and is unrelated to applicants' claimed subject matter.

For the foregoing reasons, it is respectfully submitted that neither of the cited references, nor any combination of them, pertains to subject matter resembling that of applicants' invention and this is clearly evident to a person skilled in the art. The cited

patents to Lillie et al. and Upadhyay et al. follow a very different direction and function than applicants' invention.

In light of the above remarks, Applicant submits that the Examiner has not, and cannot, establish a *prima facie* case of obviousness with respect to independent claims 1 and 12. Withdrawal of the obviousness rejection is therefore respectfully requested.

Applicants note that if independent claims 1 and 12 are non-obvious under 35 USC 103 then any claim depending therefrom is non-obvious [see *In re Fine*, 5 USPQ2d 1596 (Fed. Cir. 1988)]. Applicant submits that the pending dependent claims are therefore allowable.

D. Allowable Subject Matter

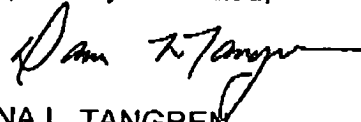
Applicants' acknowledge and agree that the subject matter of claims 4-11 and 15-19 is allowable, as stated in said Office Action, but have not rewritten these claims into independent form as suggested in said Office Action because, for the foregoing reasons, the original independent claims on which these claims depend are themselves considered to be allowable.

CONCLUSIONS

For all the foregoing reasons, applicants respectfully submit that present claims 1-19 in this application are in good order and ready for allowance. Reconsideration of the Office Action and an early Notice of Allowance are respectfully requested. In the event that the Examiner cannot allow the present application for any reason, the Examiner is encouraged to contact the undersigned agent, Dana L. Tangren, at (801) 533-9800, to discuss resolution of any remaining issues.

Dated this 24th day of August 2005.

Respectfully submitted,



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